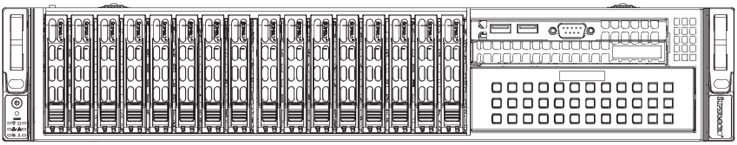
SC213 Chassis Series



SC213A-R900UB SC213A-R900LPB

SC213A-R720UB SC213A-R720LPB

USER'S MANUAL

1.0a

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.**

Super Micro Computer, Inc. ("Supermicro") reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software, if any, and documentation may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any medium or machine without prior written consent.

IN NO EVENT WILL SUPERMICRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPERMICRO SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Super Micro's total liability for all claims will not exceed the price paid for the hardware product.

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0a
Release Date: August 7, 2009

Unless you request and receive written permission from Super Micro Computer, Inc., you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Copyright © 2009 by Super Micro Computer, Inc.
All rights reserved.

Printed in the United States of America

Preface

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SC213 chassis. Installation and maintenance should be performed by experienced technicians only.

Supermicro's SC213 chassis features a unique design, which is highly optimized for data storage applications. It is equipped with 16 hot-swappable hard drives, a DVD-ROM/USB comport unit, and a 720W or 900W (redundant) high-efficiency power supply, for superb power savings. High-performance fans provide ample cooling for the chassis.

This document lists compatible parts and configurations available when this document was published. Always refer to our Web site for updates on supported parts and configurations at http://www.supermicro.com

Manual Organization

Chapter 1 Introduction

The introduction provides a list of the main components included with this chassis and describes the primary features of the SC213 chassis. This chapter also includes contact information.

Chapter 2 System Safety

Chapter 2 lists warnings, precautions, and system safety. You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed before installing and servicing the SC213 chassis.

Chapter 3 System Interface

This chapter provides details on the system interface, which includes the functions and information provided by the control panel LEDs on the chassis, and by other LEDs located throughout the system.

Chapter 4 Chassis Setup and Maintenance

Refer to this chapter for detailed information on the chassis. Follow the procedures given in this chapter when installing, removing, or reconfiguring your chassis.

Chapter 5 Rack Installation

Refer to this chapter for detailed information on chassis rack installation. You should follow the procedures given in this chapter when installing, removing or reconfiguring your chassis into a rack environment.

Appendix A

This section references cables, which are compatible with your SC213 system. Refer to our Web site for additional information on cabling at www.supermicro.com.

Appendix B

This chapter lists supported power supply information for your SC213 system. Refer to our Web site for additional details at www.supermicro.com.

Appendix C

This section provides detailed information on the SAS-213A backplane. Additional information can by found on our Web site, at www.supermicro.com

Table of Contents

Chapter 1 Introduction

1-1 Overview 1-1
1-2 Shipping List 1-1
1-3 Contacting Supermicro 1-2
1-4 Returning Merchandise for Service 1-3

Chapter 2 System Safety

2-1 Overview 2-1
2-2 Warnings and Precautions 2-1
2-3 Preparing for Setup 2-1
2-4 Electrical Safety Precautions 2-2
2-5 General Safety Precautions 2-3
2-6 System Safety 2-3

Chapter 3 System Interface

3-1 Overview 3-1
3-2 Control Panel Buttons 3-2
3-3 Control Panel LEDs 3-2
3-4 Drive Carrier LEDs 3-4

Chapter 4 Chassis Setup and Maintenance

4-1 Overview 4-1
4-2 Installation and General Maintenance 4-1
    Installation Topics 4-1
    General Maintenance Topics 4-1
4-3 Removing the Chassis Cover 4-2
4-4 Installing Hard Drives 4-3
4-5 Installing the I/O Shield 4-5
    I/O Shield 4-5
4-6 Installing Chassis Standoffs 4-6
    Permanent and Optional Standoffs 4-6
4-7 Installing the Motherboard 4-7
4-8 Installing the Add-on Cards 4-9
    Installing Add-on Cards in Low-Profile Model Chassis 4-9
    Installing Riser Cards and Add-on Cards in UIO Models 4-10
4-9 Installing the Air Shroud 4-12
    Installing the Air Shroud in the Chassis 4-12
    Installing the Additional Air Shroud 4-13
4-10 Checking the Air Flow 4-14

Installation Complete 4-15
4-11 System Fans 4-16
4-12 Power Supply 4-18
4-13 Installing the Power Distributor 4-19
4-14 Removing the Backplane 4-20
4-15 Installing the Backplane 4-22

Chapter 5 Rack Installation

5-1 Overview 5-1
5-2 Unpacking the System 5-1
5-3 Preparing for Setup 5-1
Choosing a Setup Location 5-1
5-4 Warnings and Precautions 5-2
Rack Precautions 5-2
General Server Precautions 5-2
5-5 Rack Mounting Considerations 5-3
Ambient Operating Temperature 5-3
Reduced Airflow 5-3
Mechanical Loading 5-3
Circuit Overloading 5-3
Reliable Ground 5-3
5-6 Rack Mounting Instructions 5-4
Identifying the Sections of the Rack Rails 5-4
Locking Tabs 5-5
Releasing the Inner Rail 5-5
Installing The Inner Rails on the Chassis 5-6
Installing the Outer Rails on the Rack 5-7
Standard Chassis Installation 5-8
Optional Quick Installation Method 5-9

Appendix A SC213 Chassis Cables

Appendix B SC213 Power Supply Specifications

Appendix C SAS-213A Backplane Specifications

Notes

Chapter 1

Introduction

1-1 Overview

Supermicro's SC213 chassis provides 16 hot-swappable 2.5" SAS/SATA hard drive bays, one 5.25" hard drive, one slim DVD and one slim floppy drive in an efficient 2U form factor, designed for the most frequently encountered applications. The chassis is also equipped with a redundant 720W Gold Level (93%) or 900W high-efficiency (85%+) power supply for outstanding power savings, with specially designed optimized cooling.

1-2 Shipping List

Please visit the following link for the latest shipping lists and part numbers for your particular chassis model. http://www.supermicro.com/products/chassis/2U/?chs=213

SC213

Model	CPU	HDD	I/O Slots	Power Supply
SC213A-R720LPB	UP/DP	16x 2.5" hot-swap SAS/SATA	7x LP	720W Redundant (Gold Level)
SC213A-R700UP	UP/DP	16x 2.5" hot-swap SAS/SATA	4x FF + 3x LP	720W Redundant (Gold Level
SC213A-R900UB	UP/DP	16x 2.5" hot-swap SAS/SATA	4x FF + 3x LP	900W Redundant
SC213A-R900LPB	UP/DP	16x 2.5" hot-swap SAS/SATA	7x LP	900W Redundant

1-3 Contacting Supermicro

Headquarters

Address: Super Micro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

Europe

Address: Super Micro Computer B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands
Tel: +31 (0) 73-6400390
Fax: +31 (0) 73-6416525
Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific

Address: Super Micro Computer, Inc.
4F, No. 232-1, Liancheng Rd.
Chung-Ho 235, Taipei County
Taiwan, R.O.C.
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8226-1900

1-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 2

System Safety

2-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following the steps in the order provided should enable you to have your chassis setup and operational within a minimal amount of time. This quick set up assumes that you are an experienced technician, familiar with common concepts and terminology.

2-2 Warnings and Precautions

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, file a damage claim with carrier who delivered your system.

Decide on a suitable location for the rack unit that will hold the chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated.

You will also need it placed near at least one grounded power outlet. When configured, the SC213 chassis includes a power supply which requires a grounded outlet.

2-3 Preparing for Setup

The SC213 chassis includes a set of rail assemblies, including mounting brackets and mounting screws you will need to install the systems into a rack. Please read this manual in its entirety before beginning the rack installation procedure.

2-4 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SC213 from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high-voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives (not necessary for hot-swappable drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords from all the power supply modules in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: CAUTION - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM laser: CAUTION - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

2-5 General Safety Precautions

- Keep the area around the chassis clean and free of clutter.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

2-6 System Safety

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Chapter 3

System Interface

3-1 Overview

There are several LEDs on the control panel as well as other LEDs on the drive carriers to keep you constantly informed of the over-all status of the system, as well as the activity and health of specific components. Most SC213 models are two buttons on the control panel: a reset button and an on/off switch. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

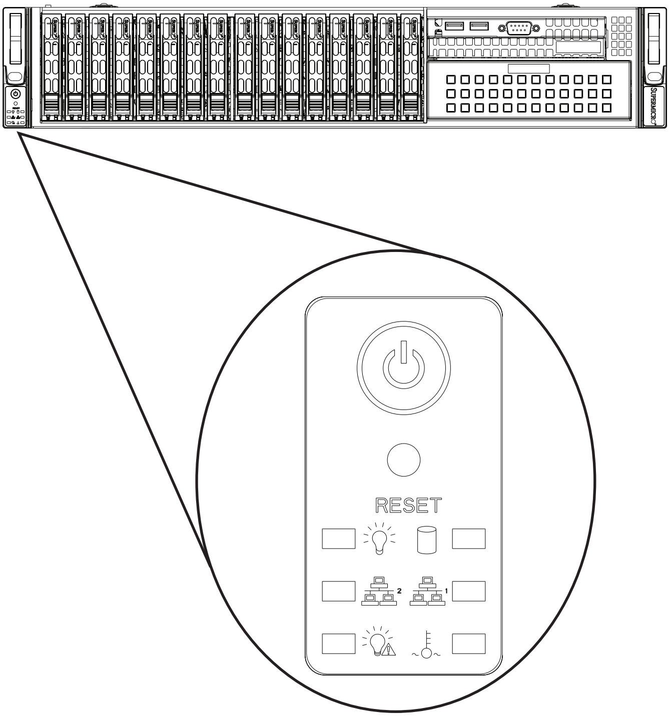
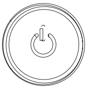


Figure 3-1: Chassis User Interface

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are a power on/off button and a reset button.

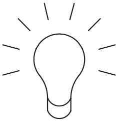


- **Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.

- **Reset:** The reset button is used to reboot the system. A needle, pen, or other small device is required to activate this button and reset the system

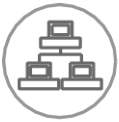
3-3 Control Panel LEDs

The control panel located on the front of the SC213 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

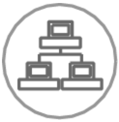


- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

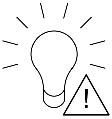
- **HDD:** Indicates IDE channel activity. SAS/SATA drive and/or DVD-ROM drive activity when flashing.



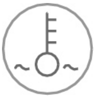
- **NIC2:** Indicates network activity on GLAN2 when flashing.



- **NIC1:** Indicates network activity on GLAN1 when flashing.



- **Power Failure:** When this LED flashes, it indicates a power failure in the power supply.



- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When continuously on (not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists.

3-4 Drive Carrier LEDs

Your chassis uses SAS or SATA, but not both at the same time.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- **Green or Blue:** Each hard disk drive carrier has either a green or a blue LED, depending upon the hard disk drives and backplane used. When illuminated, this LED indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red:** The red LED indicates a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 4

Chassis Setup and Maintenance

4-1 Overview

This chapter covers the steps required to install components and perform maintenance on the SC213 chassis. The only tool you will need to install components and perform maintenance is a Phillips screwdriver, and under certain circumstances, a hex wrench.

In cases where the installation or maintenance procedures differ between the UIO and low profile chassis models, alternative instructions or illustrations are provided.

4-2 Installation and General Maintenance

The following sections will provide you with information on installing components and performing general mainenance on the system.

Installation Topics

Removing the Chassis Cover
Installing Hard Drives
Installing the Motherboard
Installing the Air Shroud
Completing the Installation

General Maintenance Topics

System Fans
Power Supply

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2 System Safety and the warning/precautions listed in the setup instructions.

4-3 Removing the Chassis Cover

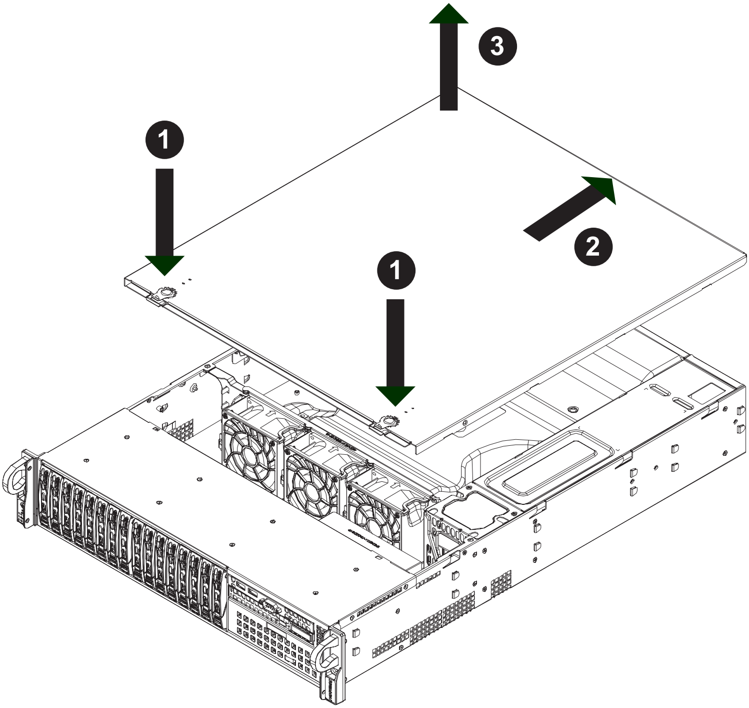


Figure 4-1: Removing the Chassis Cover

Removing the Chassis Cover the Chassis Cover

1. Press both release tabs at the same time to release the cover from the locked position.

2. Once the top cover has been released, slide the cover backwards, toward the rear of the chassis.

3. Lift the cover up and off the chassis.

Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

4-4 Installing Hard Drives

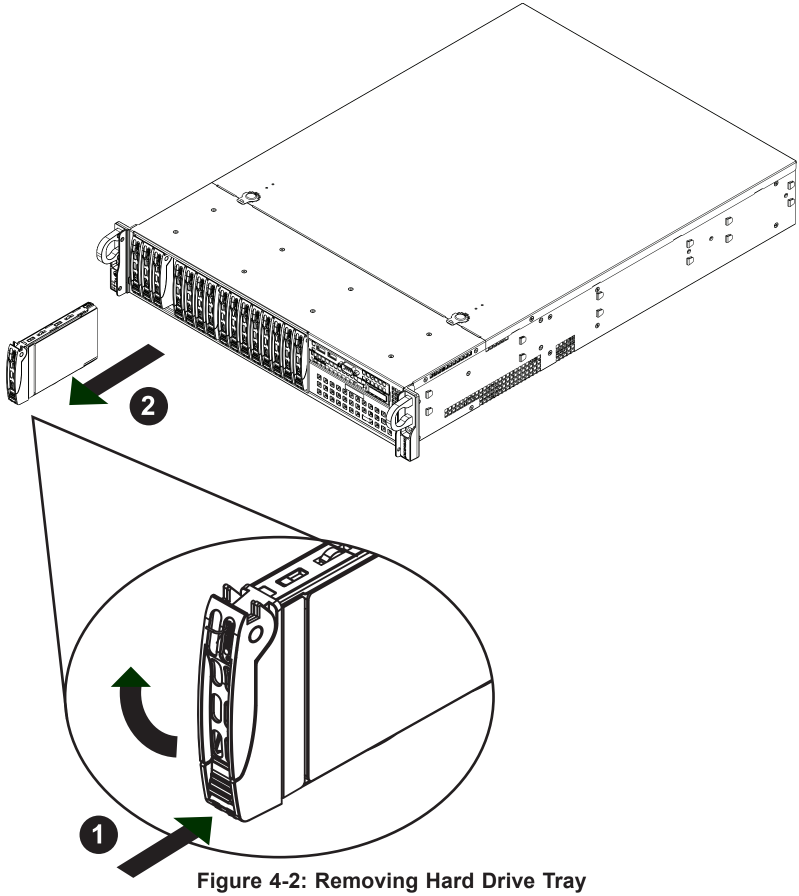


Figure 4-2: Removing Hard Drive Tray

The SC213 comes equipped with sixteen hot-swappable hard drives. Only SAS or enterprise SATA HDDs are recommended for use in the SC213 chassis.

Removing Hard Drive Trays from the Chassis

1. Press the release button on the drive carrier. This extends the drive carrier handle.
2. Hold the handle to pull the tray out of the chassis.

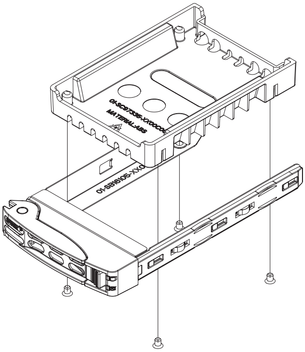


Figure 4-3: Chassis Drive Tray

Installing a Hard Drive into a Drive Carrier

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.

2. Align the drive in the carrier so that the mounting holes of both are aligned. Note that there are holes in the carrier marked "SAS" or “SATA” to aid in correct installation.

3. Secure the drive to the carrier with four screws as illustrated above. Use the four M3 flat-head screws included in the HDD bag of your accessory box. Note that the screws used to secure the dummy drive to the tray cannot be used to secure the hard drive.

4. Insert the hard drive and drive carrier into its bay vertically, keeping the carrier oriented so that the release button is on the bottom. When the carrier reaches the rear of the bay, the release handle will retract.

5. Using the thumb, push against the upper part of the hard drive handle. Push the hard drive into the hard drive bay as illustrated below, until the hard drive clicks into the locked position.

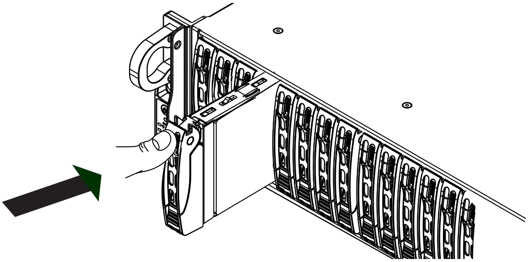


Figure 4-4: Proper Installation of the Hard Drive into the Hard Drive Bay

4-5 Installing the I/O Shield

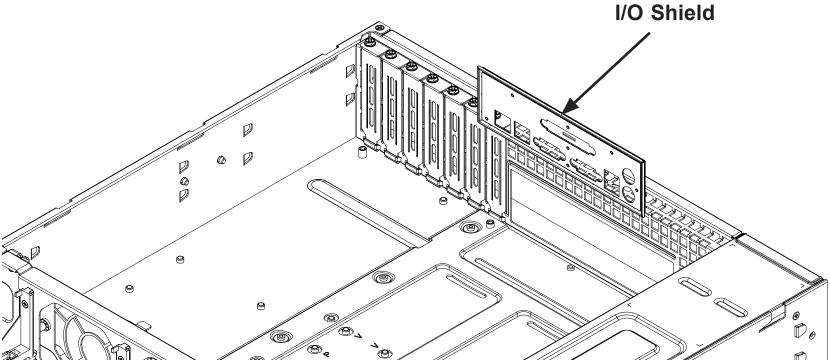


Figure 4-5: I/O Shield Placement

I/O Shield

The I/O shield holds the motherboard ports in place. Install the I/O shield before installing the motherboard. If the motherboard you purchased did not include a standard I/O shield, contact the motherboard vendor for a compatible shield.

Installing the I/O Shield

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Open the chassis cover.

3. With the illustrations facing the outside of the chassis, place the shield into the space provided at the rear of the chassis as illustrated above.

4-6 Installing Chassis Standoffs

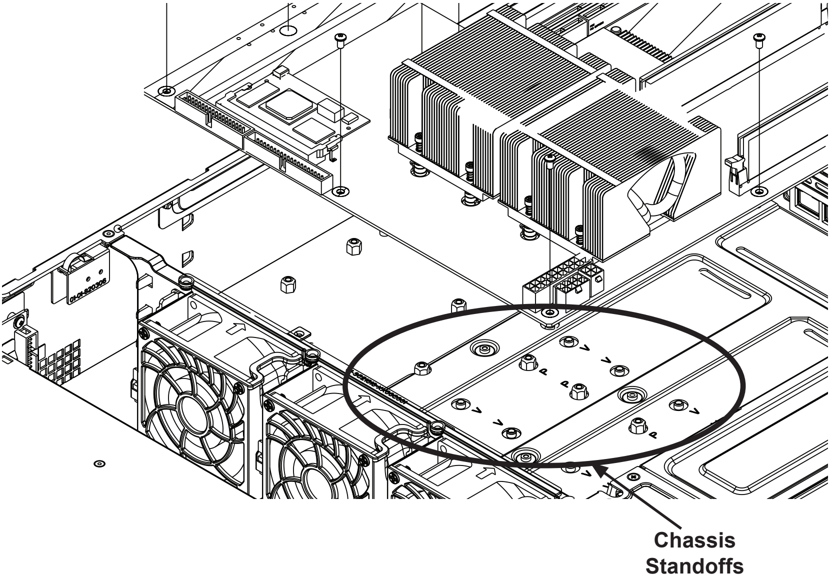


Figure 4-6: Chassis Standoffs

Permanent and Optional Standoffs

Standoffs prevent short circuits by creating space between the motherboard and the chassis surface. The SC213 chassis includes permanent standoffs in locations used by most motherboards. These standoffs accept the rounded Phillips head screws which are included in the SC213 accessories packaging.

Some motherboards require additional screws for heatsinks, general components and/or non-standard security. Optional standoffs are included for these motherboards. To use an optional standoff, place the hexagonal nut with the rounded side up, in the holes provided on the floor of the chassis.

4-7 Installing the Motherboard

Installing the Motherboard

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, precautions, and cable connections.

2. Open the chassis cover.

3. If necessary, remove the air shroud and riser card bracket.

4. Ensure that the I/O shield has been installed correctly.

5. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff and remove any standoffs that are not required by the motherboard.

6. Lay the motherboard on the chassis aligning the permanent and optional standoffs

7. Secure the motherboard to the chassis using the rounded, Phillips head screws which are included in the motherboard bag of the accessory box. Do not exceed eight pounds of torque when tightening down the motherboard.

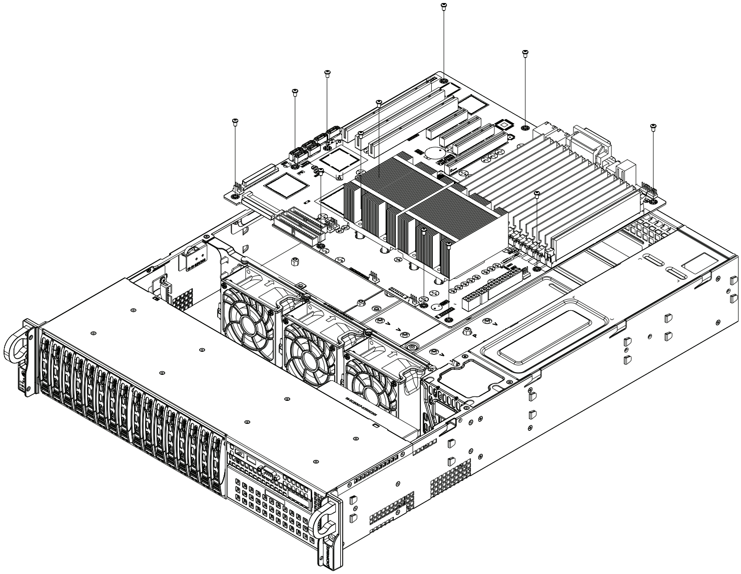


Figure 4-7: Installing the Low Profile Motherboard

8. Secure the CPU(s), heatsinks, and other components to the motherboard as described in the motherboard documentation.

9. Connect the cables between the motherboard, backplane, chassis, front panel, and power supply, as needed. Additionally, the fans may be temporarily removed to allow access to the backplane ports and to allow for ease of installation.

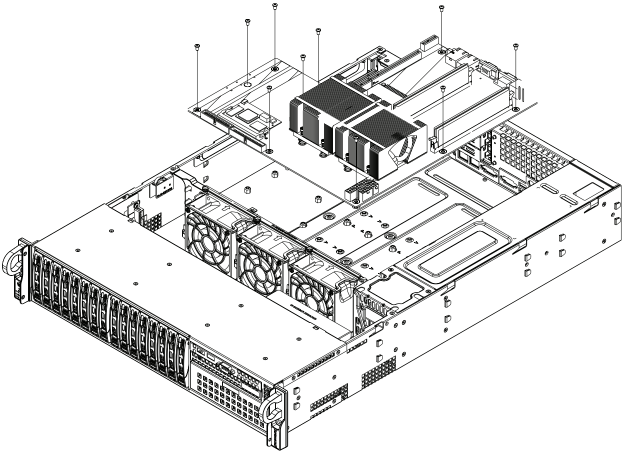


Figure 4-8: Installing the UIO Motherboard

4-8 Installing the Add-on Cards

Add-on card installation in the SC213 chassis differs between the UIO and low-profile chassis models. See below for directions that are specific you your chassis type.

Installing Add-on Cards in Low-Profile Model Chassis

Installing Add-on Card Brackets - Low-Profile Chassis Models

1. Remove the chassis cover and ensure that the motherboard has been properly installed.

2. Locate the vertical add-on card slots in the rear of the SC213 chassis.

3. Remove the blank bracket which is pre-installed in the chassis.

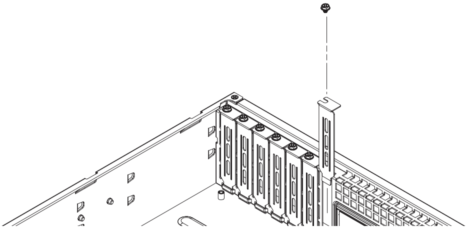


Figure 4-9: Removing the Blank Add-on Card Bracket

4. Simultaneously slide the add-on card carefully into the bracket and plug it into the slot on the motherboard.

5. Screw the add-on card bracket onto the chassis.

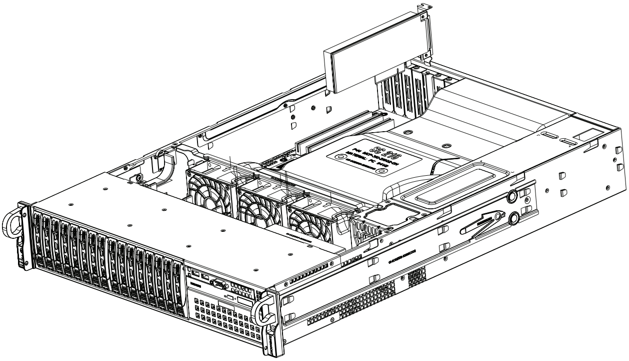


Figure 4-10: Installing the Low Profile Add-on Card

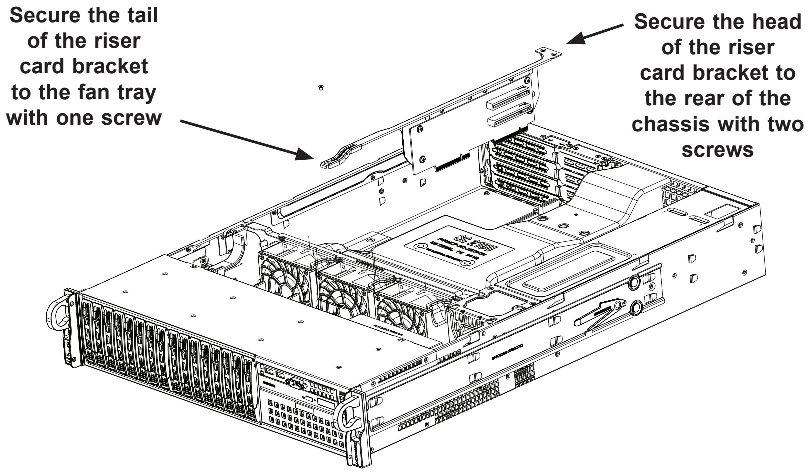

Secure the tail of the riser card bracket to the fan tray with one screw
Secure the head of the riser card bracket to the rear of the chassis with two screws

Figure 4-11: Installing the UIO Riser Card Bracket

Installing Riser Cards and Add-on Cards in UIO Models

Installing the Riser Card - UIO Chassis Models

1. Remove the chassis cover.
2. Remove the riser bracket.
3. Install the riser card onto the riser bracket. Note that there are different cards for the right and left side of the bracket.
4. Gently slide the riser card bracket with the riser card installed into the chassis and simultaneously plug the riser card into the slot on the motherboard.
5. Locate the three screws on your riser card bracket and secure it to the chassis as illustrated above.

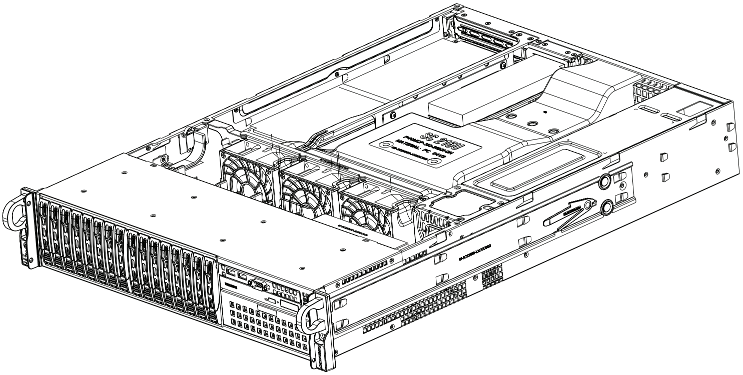


Figure 4-12: UIO Add-on Card Installed

Installing the Add-on Cards in UIO Chassis Models

1. Ensure that the riser card and riser card bracket have been correctly installed in the chassis.
2. Remove the blank bracket from the rear slot in the chassis.
3. Slide the add-on card horizontally into the slot on the riser card.
4. Secure the add-on-card with its clip into the rear slot of the chassis.

4-9 Installing the Air Shroud

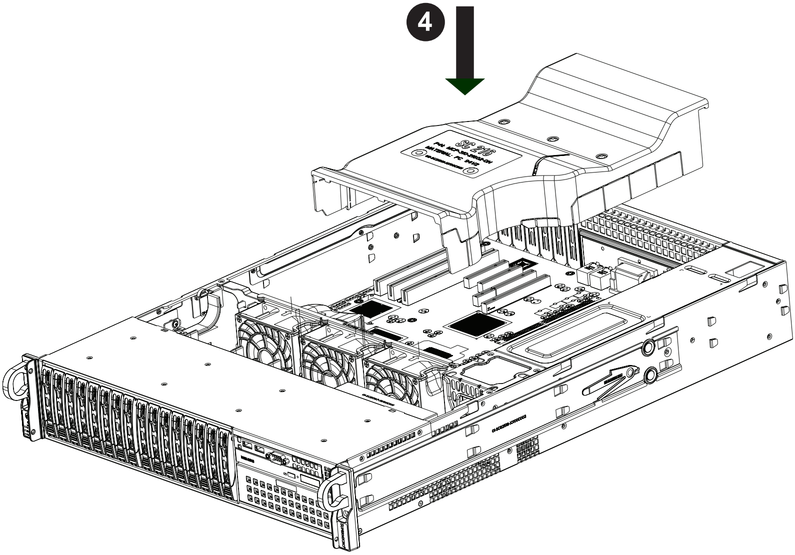


Figure 4-13: Air Shroud Installation

Air shrouds concentrate airflow to maximize fan efficiency. The SC213 chassis air shroud does not require screws for installation.

Installing the Air Shroud in the Chassis

Installing the Air Shroud

1. Lay the chassis on a flat, stable surface and remove the chassis cover.

2. Ensure that the motherboard, CPU, heatsink and memory are all properly installed.

3. If necessary, move any cables that interfere with the air shroud placement.

4. Place the air shroud in the chassis. The air shroud fits just behind the three fans in the fan rack. Slide the air shroud into the grooves just behind the fan rack.
   Note that some motherboards may require the air shroud to be modified to fit over the motherboard. The SC213 chassis air shroud is designed with break-away pieces that may be removed to accomodate differing styles of motherboards.

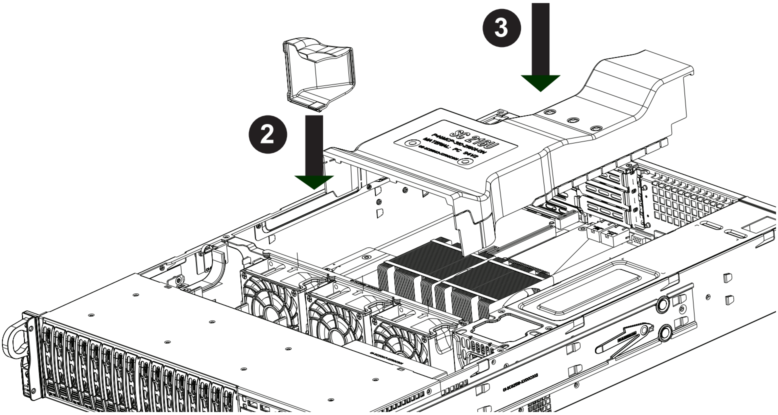


Figure 4-14: UIO Air Shroud Installation

An additional air shroud is required for high-powered CPUs, to provide extra cooling. Install the additional air shroud if necessary.

Installing the Additional Air Shroud

Installing the Additional Air Shroud in the Chassis

1. Remove the left side break-away piece of the main air shroud.
2. Slide the additional air shroud into the chassis before installing the main air shroud.
3. Install the main air shroud as directed on the previous page.

4-10 Checking the Air Flow

Checking the Server's Air Flow

1. Make sure there are no objects to obstruct airflow in and out of the server. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.

2. Do not operate the server without drives or drive trays in the drive bays. Use only recommended server parts.

3. Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

The control panel LEDs inform you of system status. See “Chapter 3: System Interface” for details on the LEDs and the control panel buttons.

Installation Complete

In most cases, the chassis power supply and fans are pre-installed. If you need to install fans continue to the Systems Fan section of this chapter. If the chassis will be installed into a rack, continue to the next chapter for rack installation instructions.

4-11 System Fans

Three heavy duty fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature. The SC213 fans are hot-swappable, enabling the fans to be replaced without powering -down the system.

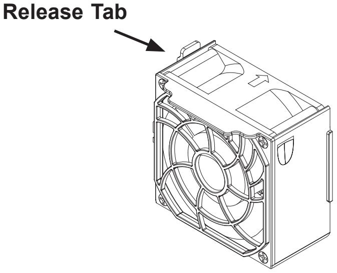


Figure 4-15: System Fan

Replacing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan requires changing. (Never run the server for an extended period of time with the chassis open.)

2. Press the fan release tab to lift the failed fan from the chassis and pull it completely out of the chassis.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

4. The fan will automatically begin running at the correct speed.

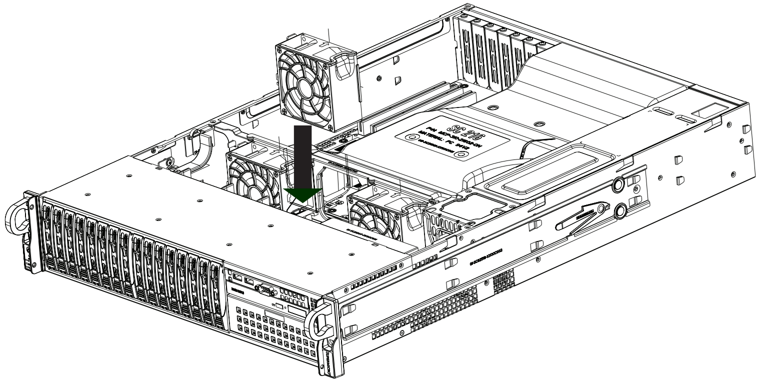


Figure 4-16: Placing the Low Profile System Fan

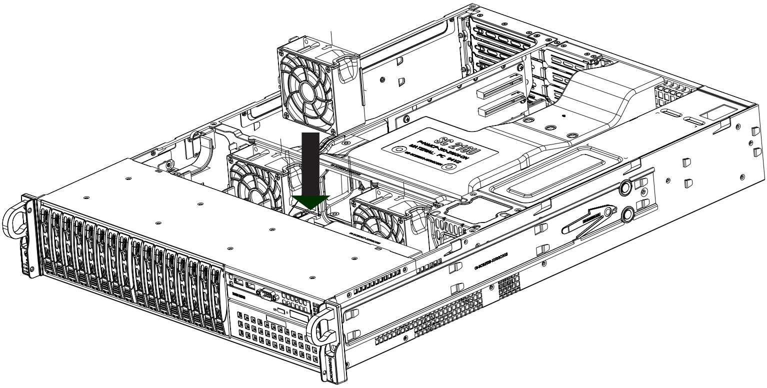


Figure 4-17: Placing the UIO System Fan

4-12 Power Supply

The SC213 chassis has two redundant 720 or 900 Watt power supplies. The power modules are hot-swappable, enabling the power supplies to be changed without powering down the system. These power supplies are auto-switching capable. This enables the power supply to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

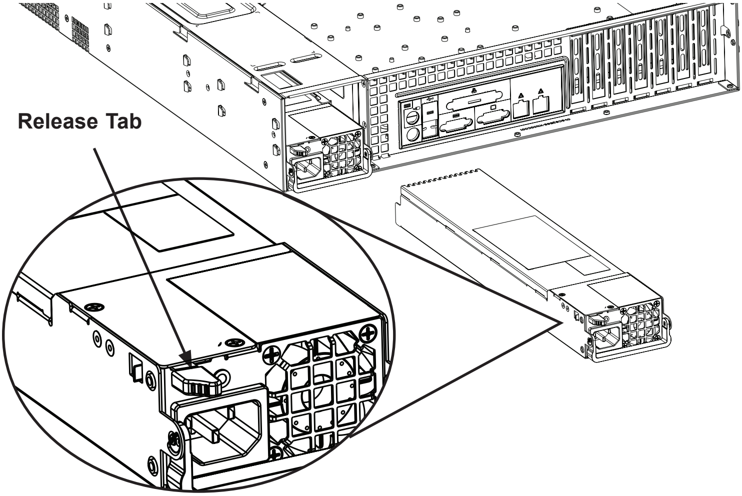


Figure 4-18: Removing the Power Supply

Changing the Power Supply

1. Determine which power supply needs to be replaced and unplug the power cord to that module.
2. Push the release tab (on the back of the power supply) as illustrated to release the power module from the chassis.
3. While holding down the release tab, pull the power supply out using the handle provided on the power module.
4. Replace the failed power module with the same model power supply.
5. Push the new power supply module into the power bay until the tab clicks into the locked position.
6. Plug the AC power cord back into the module and the replacment power module will automatically power-up.

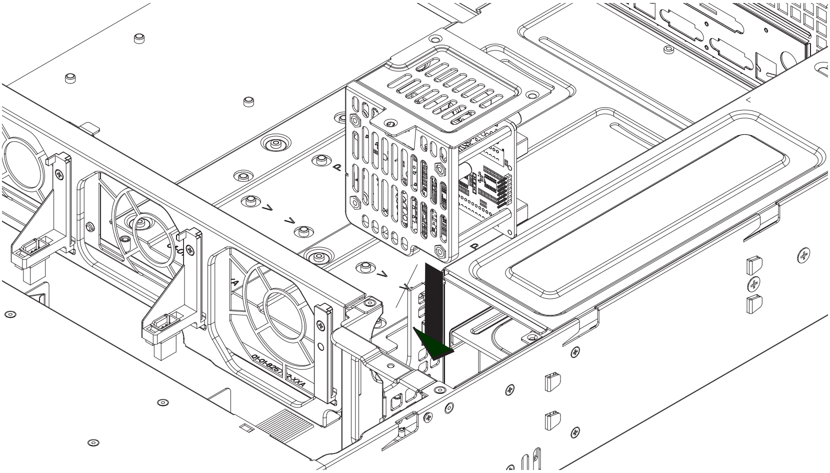


Figure 4-19: Installing the Power Distributor

4-13 Installing the Power Distributor

The power distributor provides failover and power supply redundancy and is pre-installed in the chassis. In the rare event that you have to replace the power distributor, follow the steps below.

Changing the Power Distributor

1. Power down the server and unplug the power cord from the power module.
2. Remove all cable connections to the power supply from the motherboard, backplane, and other components. Also, remove both power supply modules.
3. Remove the screws securing the power distributor.
4. Gently pull the power distributor from the chassis. Gently guide all the cables through the power distributor housing.
5. Slide the new power distributor module into the power distributor housing. Make that you slide the cables through the bottom of the housing.
6. Reconnect all the power cables, replace the power supply, and insert the plug into the wall.

4-14 Removing the Backplane

The SC213 chassis backplane is located behind the hard drives and in front of the front system fans. In order to change jumper settings on the backplane, it may be necessary to remove the backplane from the chassis.

Removing the Backplane from the Chassis

1. Power down and unplug the system from any power source.
2. Remove the chassis cover.
3. Disconnect the cabling to the backplane.
4. Remove all of the hard drives from the hard drive bays in the front of the chassis
5. Remove the three upper screws at the top of the backplane, indicated by the arrows below.

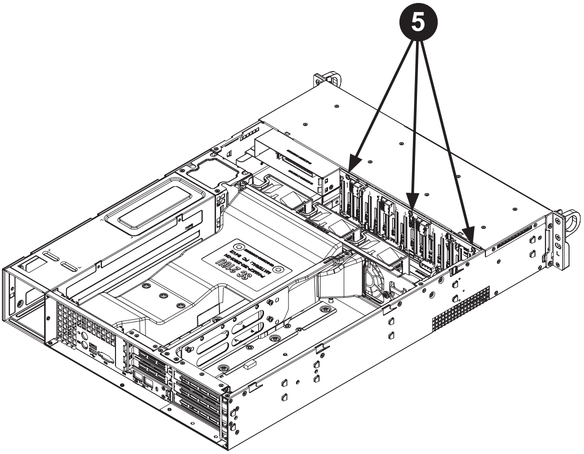


Figure 4-20: Removing the Screws at the Top of the Backplane

6. Loosen but do not remove the three screws in the spring bar, located on the floor of the chassis, indicated by the arrows below.

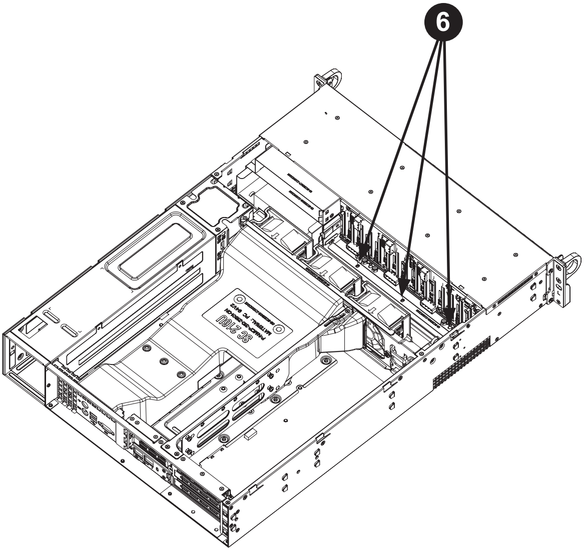


Figure 4-21: Loosening the Spring Bar Screws in the Floor of the Chassis

7. Gently ease the backplane up and out of the chassis.

4-15 Installing the Backplane

Installing the Backplane into the Chassis

1. Ensure that all of the hard drive trays have been removed from the bays in the front of the chassis and that the spring bar has been loosened as directed in the previous section.

2. Slide the backplane into the chassis at a slight angle, pushing it up against the side of the chassis.

3. Ease the backplane forward, against the front of the chassis. This will aid in the alignment of the mounting holes.

4. Align the mounting holes in the backplane with the holes in the chassis. Replace the three screws at the top of the backplane and the three screws in the floor of the chassis.

5. Reconnect all cables and return the hard drive trays to their bays in the front of the chassis.

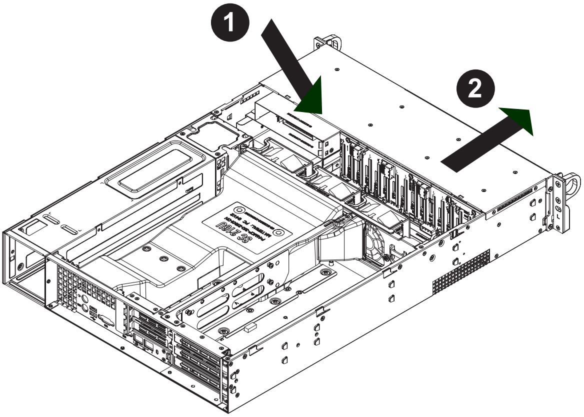


Figure 4-22: Installing the Backplane

Chapter 5

Rack Installation

5-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimal amount of time.

5-2 Unpacking the System

You should inspect the box which the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold your chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. The system needs to be placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

5-3 Preparing for Setup

The box your chassis was shipped in should include two sets of rail assemblies and the mounting screws needed for installing the system into the rack. Also included is an optional square hole to round hole converter bracket, for use in racks with round mounting holes. *Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow*.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warning!

5-4 Warnings and Precautions

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

- In single rack installations, stabilizers should be attached to the rack.

- In multiple rack installations, the racks should be coupled together.

- Always make sure that the rack is stable before extending a component from the rack.

- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components on the bottom of the rack first, and then work upwards.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug hard drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

5-5 Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

5-6 Rack Mounting Instructions

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **NOTE:** This rail will fit a rack between 26.5" and 36.4" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of three sections: An inner chassis rail which secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.

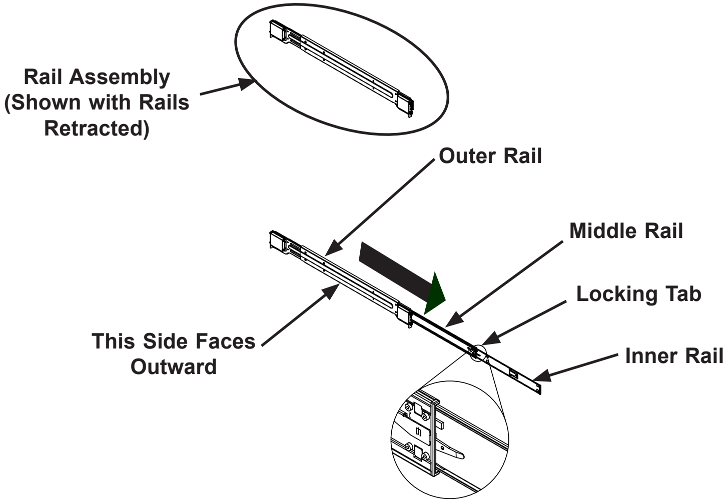

Rail Assembly (Shown with Rails Retracted)
Outer Rail
Middle Rail
Locking Tab
Inner Rail
This Side Faces Outward

Figure 5-1: Identifying the Outer Rail, Middle Rail and Inner Rails (Left Rail Assembly Shown)

Locking Tabs

Each inner rail has a locking tab. This tab locks the chassis into place when installed and pushed fully into the rack. These tabs also lock the chassis in place when fully extended from the rack. This prevents the server from coming completely out of the rack when when the chassis is pulled out for servicing.

Releasing the Inner Rail

Releasing Inner Rail from the Outer Rails

1. Identify the left and right outer rail assemblies as described on page 5-4.

2. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.

3. Press the locking tab down to release the inner rail.

4. Repeat steps 1-3 for the second outer rail.

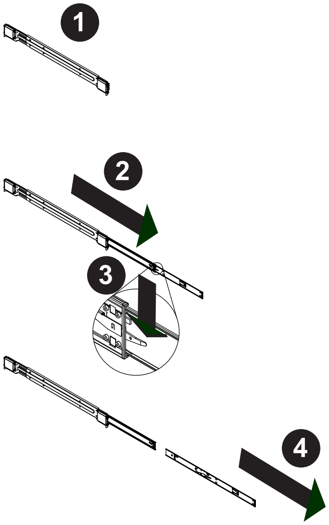


Figure 5-2: Extending and Releasing the Inner Rail

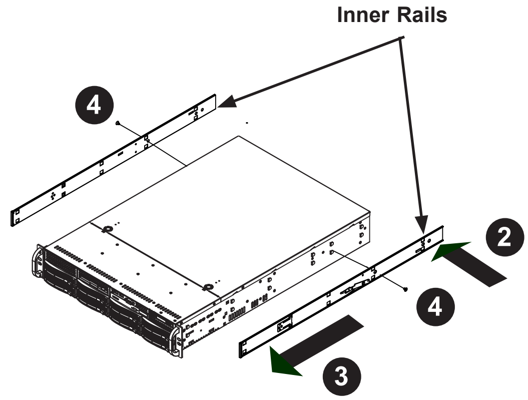


Figure 5-3: Installing the Inner Rails

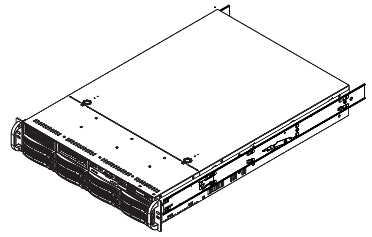


Figure 5-4: Inner Rails Installed on the Chassis
(The chassis above are an example only. Actual chassis may differ slightly)

Installing The Inner Rails on the Chassis

Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.
2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.
3. Slide the inner rail forward toward the front of the chassis until the rail clicks into the locked position, which secures the inner rail to the chassis.
4. Secure the inner rail to the chassis with the screws provided.
5. Repeat steps 1 through 4 above for the other inner rail.

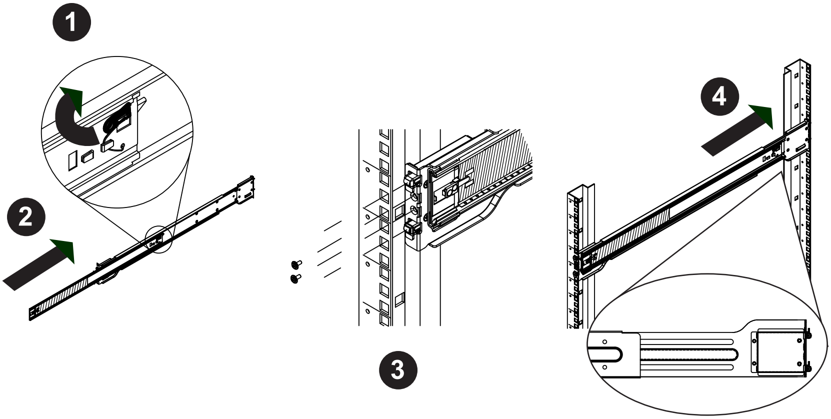


Figure 5-5: Extending and Releasing the Outer Rails

Installing the Outer Rails on the Rack

Installing the Outer Rails

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

3. Hang the hooks of the front of the outer rail onto the slots on the front of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.

4. Pull out the rear of the outer rail, adjusting the length until it fits within the posts of the rack.

5. Hang the hooks of the rear portion of the outer rail onto the slots on the rear of the rack. If necessary, use screws to secure the rear of the outer rail to the rear of the rack.

6. Repeat steps 1-5 for the remaining outer rail.

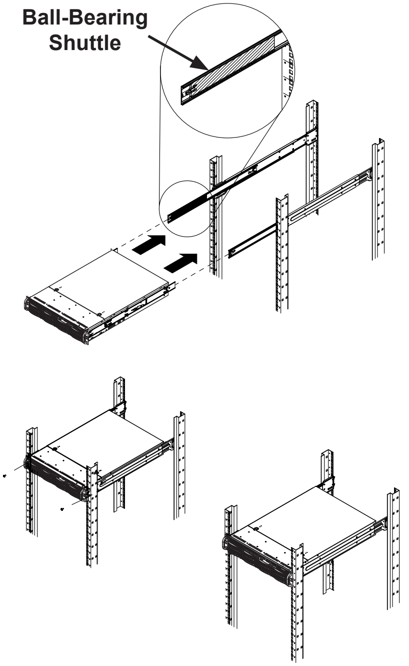


Figure 5-6: Installing into a Rack

Standard Chassis Installation

Installing the Chassis into a Rack

1. Confirm that the inner rails are properly installed on the chassis.

2. Confirm that the outer rails are correctly installed on the rack.

3. Pull the middle rail out from the front of the outer rail and make sure that the ball-bearing shuttle is at the front locking position of the middle rail.

4. Align the chassis inner rails with the front of the middle rails.

5. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides, until the locking tab of the inner rail clicks into the front of the middle rail, locking the chassis into the fully extended position.

6. Depress the locking tabs of both sides at the same time and push the chassis all the way into the rear of the rack.

7. If necessary for security purposes, use screws to secure the chassis handles to the front of the rack.

Optional Quick Installation Method

The following quick installation method may be used to install the chassis onto a rack.

Installing the Chassis into a Rack

1. Install the whole rail assembly onto the rack as described on page 5-7.
2. Release the inner rail without retracting the middle rail.
3. Install the inner rails on the chassis as previously described on page 5-6.
4. Install the chassis onto the middle rail as described in the previous section.

Notes

Appendix A

SC213 Chassis Cables

A-1 Overview

This appendix lists supported cables for your chassis system. It only includes the most commonly used components and configurations. For more compatible cables, refer to the manufacturer of the motherboard you are using and our Web site at: www.supermicro.com.

A-2 Cables Included with SC213 Chassis (SAS/SATA)

SC213A-R720LPB, SC213A-R720UB, SC213A-R900UB, SC213A-R900LPB			
Part #	**Type**	**Length**	**Description**
CBL-0087	Cable	20"	Round 16 to 16 pin ribbon front panel cable
CBL-0088	Cable	10.5"	4-pin middle fan power extension (PWM)
CBL-217L	Cable	8.66"	16-pin control panel converter cable,

A-3 Compatible Cables

These cables are compatible with the SC213 Chassis.

Alternate SAS/SATA Cables

Some compatible motherboards have different connectors. If your motherboard has only one SAS connector that the SAS/SATA cables must share, use one of the following cables. These cables must be purchased separately.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0175L
Alt. Name: "Big Four"

Description: This cable has one SFF-8484 (32 pin) connector on one end and 4 SAS connectors (7 pins each) at the other. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0116
Alt. Name: iPass or "Small Four"

Description: This cable has one ipass (SFF-8087/mini-sas) connector (36 pins) at one end and 4 SAS connectors on one end. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Extending Power Cables

Although Supermicro chassis are designed to be efficient and cost-effective, some compatible motherboards have power connectors located in different areas.

To use these motherboards you may have to extend the power cables to the motherboards. To do this, use the following chart as a guide.

Power Cable Extenders		
Number of Pins	**Cable Part #**	**Length**
24 pin	CBL - 0042	7.9”(20 CM)
20 pin	CBL - 0059	7.9”(20 CM)
8 pin	CBL - 0062	7.9”(20 CM)
4 pin	CBL - 0060	7.9”(20 CM)

Front Panel to the Motherboard

The SC213 chassis includes a cable to connect the chassis front panel to the motherboard. If your motherboard uses a different connector, use the following list to find a compatible cable.

Front Panel to Motherboard Cable (Ribbon Cable)		
Number of Pins (Front Panel)	**Number of Pins (Motherboard**	**Cable Part #**
16 pin	16 pin	CBL - 0049
16 pin	20 pin	CBL - 0048
20 pin	20 pin	CBL - 0047
16 pin	varies*	CBL - 0068
20 pin	varies*	CBL - 0067

* Split cables: Use these cables if your motherboard requires several different connections from the front panel.

Notes

Appendix B

SC213 Power Supply Specifications

This appendix lists power supply specifications for your chassis system.

SC213A-R900UB, SC213A-R900LPB	
	900W
MFR Part #	PWS-902-1R with PDB
Rated AC Voltage	100 - 240V 60 - 50Hz 11 - 4.5 Amp
+5V standby	4 Amp
+12V	75 Amp
+5V	45 Amp
+3.3V	24Amp
-12V	0.6 Amp

SC213A-R720LPB, SC213A-R720UB	
	720W
MFR Part #	PWS-721P-1R with PDB
AC Input	100 - 240V 60 - 50Hz 9-4 Amp
DC Output	
+5V standby	3 Amp
+12V	59 Amp
+5V	45 Amp
+3.3V	24Amp
-12V	0.6 Amp

Notes

Appendix C

SAS-213A Backplane Specifications

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

C-1 ESD Safety Guidelines

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

C-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

C-3 A Note to Users

- All images and layouts shown in this user's guide are based upon the latest PCB Revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

C-4 Introduction to the SAS-213A Backplane

The SAS-213A backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects SAS-213A Revision 1.00, the most current release available at the time of publication. Always refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Jumper Settings and Pin Definitions

C-5 Front Connectors and Jumpers

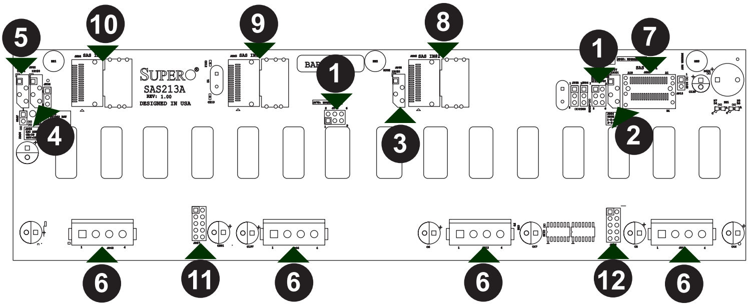

5
10
9
8
1
7
1
SUPERO
SAS213A
REV: 1.00
DESIGNED IN USA
4
3
2
6
11
6
6
12
6

Figure C-1: Front Connectors and Jumpers

Front Connectors

1. Upgrade Connectors JP69 and JP78
2. I²C Connector #1 (JP37)
3. I²C Connector #2 (JP95)
4. I²C Connector #3 (JP52)
5. I²C Connector #4 (JP96)
6. Power Connectors (4-pin): JP10, JP13, JP46, JP48
7. SAS IN#1 JSM1
8. SAS IN#2 JSM2
9. SAS IN#3 JSM3
10. SAS IN#4 JSM4
11. JP27 Activity LED #2
12. JP26 Activity LED #1

C-6 Front Connector and Pin Definitions

1. Upgrade Connectors

The upgrade connectors are designated JP69, and JP78 are used for manufacturer's diagnostic purposes only.

2. - 5. I^{2}C Connectors

The I^{2}C Connectors, designated JP37, JP95, JP52 and JP96 are used to monitor HDD activity and status. See the table on the right for pin definitions.

I^{2}C Connector Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

6. Backplane Main Power Connectors

The 4-pin connectors, designated JP10, JP13, JP46 and JP48 provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector)	
Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

7. - 10. SAS IN Ports (Sideband included)

The SAS ports are used to connect the SAS drive cables. The four SAS IN ports are designated #JSM1 - #JSM4. Each port is also compatible with SATA drives.

Sideband Definitions			
Pin #	Definition	Pin #	Definition
A11	**SGPIO:** SDIN **I^{2}C:** Backplane Addressing (SB5)	B11	Controller ID (SB6)
A12	**SGPIO:** SDOUT **I^{2}C:** Reset (SB4)	B10	GND (SB2)
A9	GND (SB3)	B9	**SGPIO:** SLOAD **I^{2}C:**SDA (SB1)
A8	Backplane ID (SB7)	B8	**SGPIO:** SCLOCK **I^{2}C:**SCL (SB0)

11. - 12. ACT_IN:

The activity LED connectors, designated JP26, and JP27 are used to indicate the activity status of each SAS drive. The activity LED connector is located on the front panel. For the activity LED connector to work properly, connect using a 10-pin LED cable. This is only used when the activity LED is not supported by the hard drive.

SAS Activity LED Header Pin Definitions

Pin#	Definition	Pin#	Definition
1	ACT IN#0	6	ACT IN#4
2	ACT IN#1	7	ACT IN#5
3	ACT IN#2	8	ACT IN#6
4	ACT IN#3	9	ACT IN#7
5	Ground	X	Empty

SAS Activity LED Header Pin Definitions

Pin#	Definition	Pin#	Definition
1	ACT IN#8	6	ACT IN#12
2	ACT IN#9	7	ACT IN#13
3	ACT IN#10	8	ACT IN#14
4	ACT IN#11	9	ACT IN#15
5	Ground	X	Empty

C-7 Front Jumper Locations and Pin Definitions

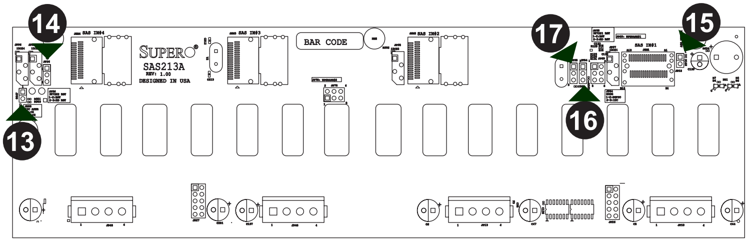
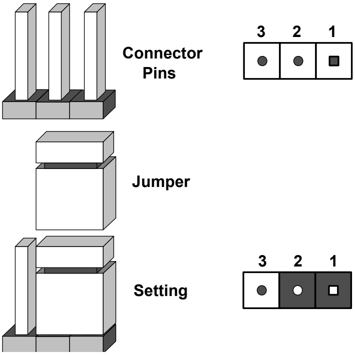

14
17
15
SAS IN#4
SUPERO
SAS213A
REV: 1.00
DESIGNED IN USA
SAS IN#3
BAR CODE
SAS IN#2
SAS IN#1
16
13

Figure C-2: Front Jumpers

13. JP80 I^{2}C Addr On C0, Off C2 (Not populated)
14. Chip Reset JP36 1-2 Reset, 2-3 No Reset (Not populated)
15. Buzzer Reset* JP18
16. JP84 1-2 SGPIO, 2-3 I^{2}C
17. Chip Reset JP35 1-2 Reset, 2-3 No Reset (Not populated)

Explanation of Jumpers


3 2 1
Connector Pins
Jumper
Setting
3 2 1

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

*The buzzer sound indicates that a condition requiring immediate attention has occurred.

The buzzer alarm is triggered by the following conditions:

1. Hard drive failure
2. Fan failure
3. System temperature over 45º Celsius.

I^2C and SGPIO Modes and Jumper Settings

This backplane can utilize I^2C or SGPIO. SGPIO is the default mode and can be used without making changes to your jumper. The following information details which jumper must be configured to use SGPIO mode or restore your backplane to I^2C mode.

SGPIO Setting (Default)		
Jumper	**Jumper Setting**	**Note**
JP84	1-2	SGPIO Mode Setting

I^2C Setting		
Jumper	**Jumper Setting**	**Note**
JP84	2-3	I^2C Setting

Front LED Indicators

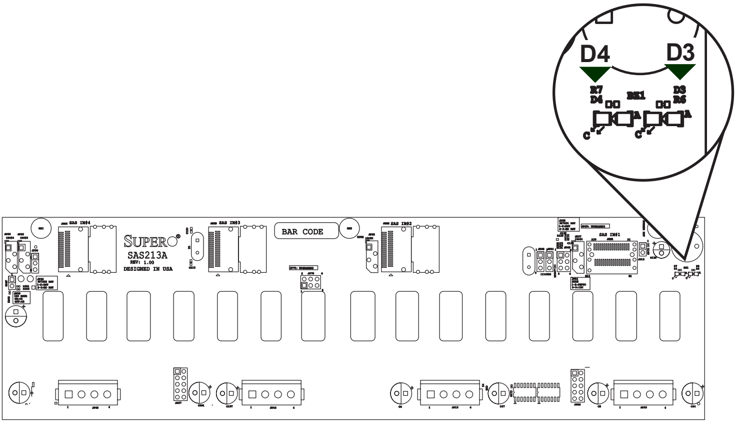

D4
D3
R7
D4
BZ1
D3
R6
C
A
SUPERO
SAS213A
REV: 1.00
DESIGNED IN USA
BAR CODE
SAS IN#4
SAS IN#3
SAS IN#2
SAS IN#1

Figure C-3: Front LEDs

Front Panel LEDs		
LED	**State**	**Specification**
D3	ON	Alarm #1
D4	ON	Alarm #2

C-7 Rear Components, Connectors and LED Indicators

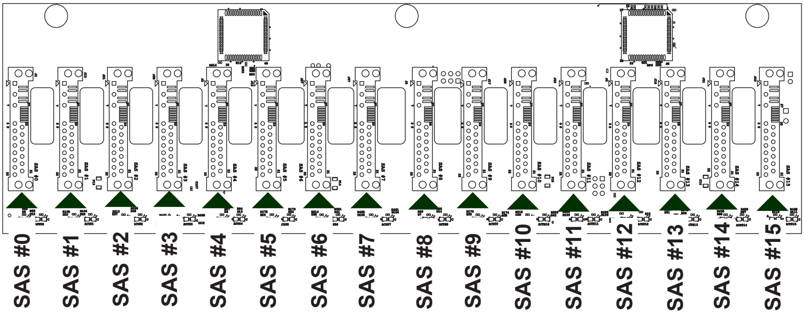

SAS #0
SAS #1
SAS #2
SAS #3
SAS #4
SAS #5
SAS #6
SAS #7
SAS #8
SAS #9
SAS #10
SAS #11
SAS #12
SAS #13
SAS #14
SAS #15

Figure C-4 Rear Connectors

Rear SAS/SATA Connectors	
Rear Connector	**SAS Drive Number**
SAS #0	SAS/SATA HDD #0
SAS #1	SAS/SATA HDD #1
SAS #2	SAS/SATA HDD #2
SAS #3	SAS/SATA HDD #3
SAS #4	SAS/SATA HDD #4
SAS #5	SAS/SATA HDD #5
SAS #6	SAS/SATA HDD #6
SAS #7	SAS/SATA HDD #7
SAS #8	SAS/SATA HDD #8
SAS #9	SAS/SATA HDD #9
SAS #10	SAS/SATA HDD #10
SAS #11	SAS/SATA HDD #11
SAS #12	SAS/SATA HDD #12
SAS #13	SAS/SATA HDD #13
SAS #14	SAS/SATA HDD #14
SAS #15	SAS/SATA HDD #15

Rear LED Indicators		
Rear LED	**Hard Drive Activity**	**Failure LED**
SAS #0	D12	D5
SAS #1	D22	D23
SAS #2	D40	D37
SAS #3	D102	D107
SAS #4	D13	D6
SAS #5	D24	D29
SAS #6	D41	D38
SAS #7	D104	D108
SAS #8	D14	D7
SAS #9	D25	D30
SAS #10	D42	D39
SAS #11	D106	D109
SAS #12	D15	D8
SAS #13	D26	D31
SAS #14	D87	D88
SAS #15	D111	D110

Notes

Disclaimer (cont.)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.